**Wrench (Watch Dogs 2) USB hub**

Preface

There are things that bother me. For example, if I don't have enough USB ports available on my computer. A meaningful invention was introduced to the market a long time ago. USB hubs. Now most (cheap) hubs are rather ugly and you don't want something like that on the table. So you can build a hub into a keyboard or an SNES game cartridge. There are hundreds of tutorials on the internet and I didn't want to copy anything this time. When Watch Dogs 2 was released, I didn't buy the game because I had no money for a console at the time. Nevertheless, I liked the Wrench character pretty much and when I saw the character in a merchandise store, I bought it and put it on my desk. Now I held my USB hub in my hand and looked at the figure. It's supposed to fit the character, isn't it?

Materials

This time I really needed a lot of material. The figure is only made of plastic, but you still have to work with better tools. So you can only try to work with a carpet knife, but I advise against it. I tried that and it's just unnecessarily tiring. It is better to use a multifunctional tool. We also need a soldering iron to solder the USB cable after cutting it open. The hot glue is important so that the parts of the back (and the ass) can be glued correctly again. You can find the complete list under the photos.
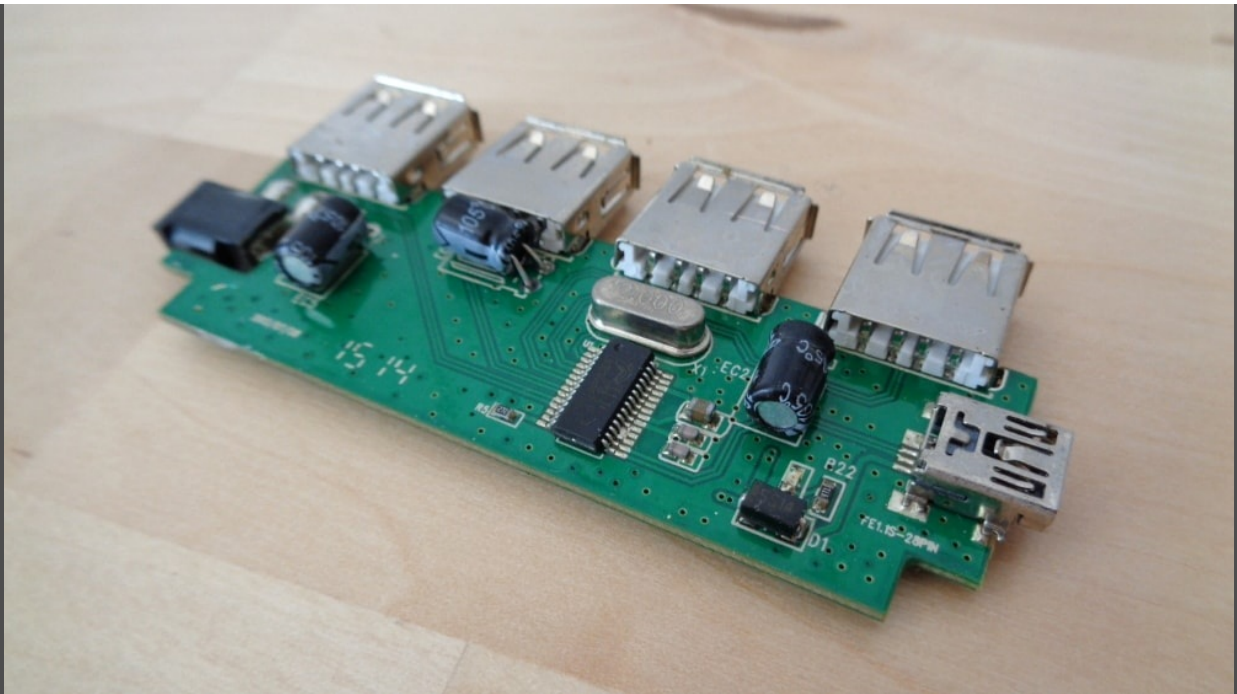
- Wrench merchandise figure
- Soldering iron
- Solder
- Soldering grease
- Helping hand
- Heat-shrink tubing
- Stripping plears
- Multifunctional device
- Grinding heads
- Cutting-off wheel
- Hot glue gun
- USB Hub
- USB Cable
- Precision Knife
- Work gloves
- Safety goggles
- Flat nose pliers
- Digital measuring device
- Drilling machine
- Drilling attachment
- Parallel vice
- Lighter
- USB-Stick or another usb device (optional for testing)

Since this has already happened to me twice that a USB hub ordered from China did not work, I

first carried out a function test. I have connected various USB devices and tested whether all connectors can transfer data. For example, you can see my modified SNES controller on the photo. In the last few years I have become accustomed to checking everything twice and three times, because this can happen quickly in electrical engineering in particular, something is not working properly and you have to look for another solution. This does not even have to be due to cheap hardware, but can also be a self-induced technical defect.

After we have checked everything, we take a model knife and open the case of the USB hub. With such small devices this is in many cases not screwed, but only glued. Unfortunately, this reduces the half roughness, which should be avoided in normal use. Better spend a little more money and use the technology longer. Of course this is great for tinkering, because you can take cheap cases apart faster.

Since I didn't know exactly how to produce a figure, I cut along the edges with my model knife. Then I could lift these edges a little and look underneath. As I had already thought, the backpatch was only glued as a single component on the back and could be removed with a jerk. one should be careful not to pull at torn or thin places because otherwise the backpatch can break.

At this section of the project, please wear safety glasses and work gloves!

Working with the multifunctional device turned out to be more difficult than expected. If you have never worked with this tool before, you should definitely practice on another object. Some points to note. Do not set the machine to the highest level, otherwise the figure's plastic may melt. First work roughly ahead so you can see how much material you can get from the figure's body. This will prevent an unwanted breakage. When your hand tenses up, take a break. Although my hands are trained, I had to get used to the machine. Try to work as neatly as possible, because that's harder than it looks. Otherwise, you'll just work your way up layer by layer. If you're not sure how much you're wearing out, you can look at the figure from the side and just guess. Better too little than too much.

As I found out during the test, the socket for an additional plug was not necessary. Most devices are powered via the USB port. I don't know what this is like with a Raspberry Pi, for example, but I only want to use this hub for smaller technology. Sometimes a USB stick to transfer data, the transmitter for my Bluetooth mouse and sometimes my SNES controller. I always charge my digital camera etc. with my power supply and I do not need the hub for this. You should try that out first, not that there's a nasty surprise.
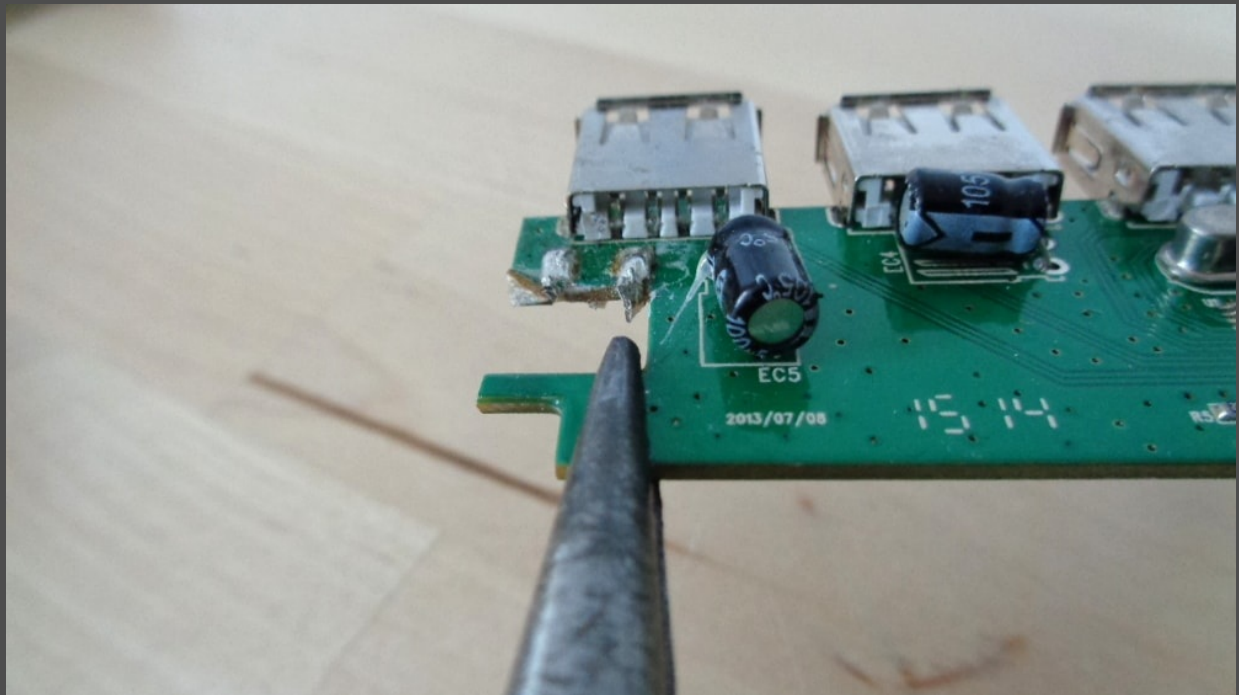

I simply broke off the socket with a flat nose pliers. You should have a look at the circuit board and assess if there are sensitive components in the vicinity. This was not the case here. It was even possible to break off a small piece of the board without damaging the tracks. If you're not sure about your device, don't use it. I had to put that away because otherwise it wouldn't have fit into the excavation.
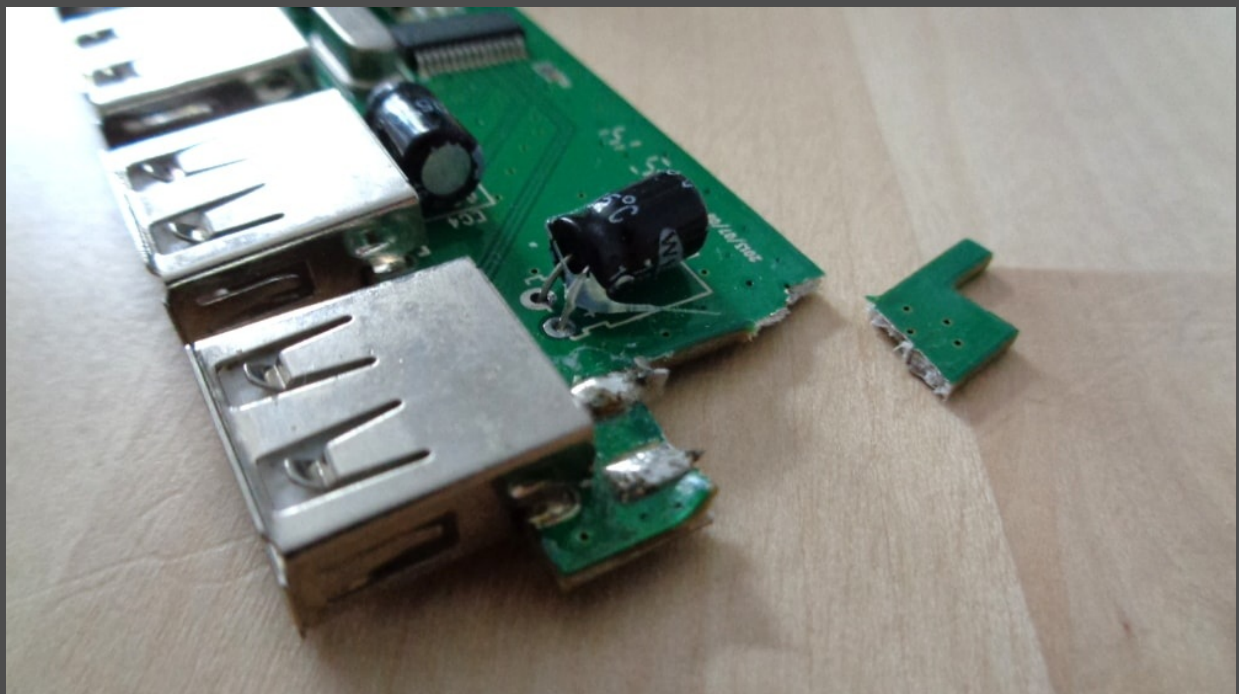

Now we need to edit the USB cable. First we roughly cut it at the end of the Mini B USB connector with a model knife (or scissors). Then we have to peel off all the plastic. Since we don't have that much space within the figure, we have to look where we can save superfluous materials.
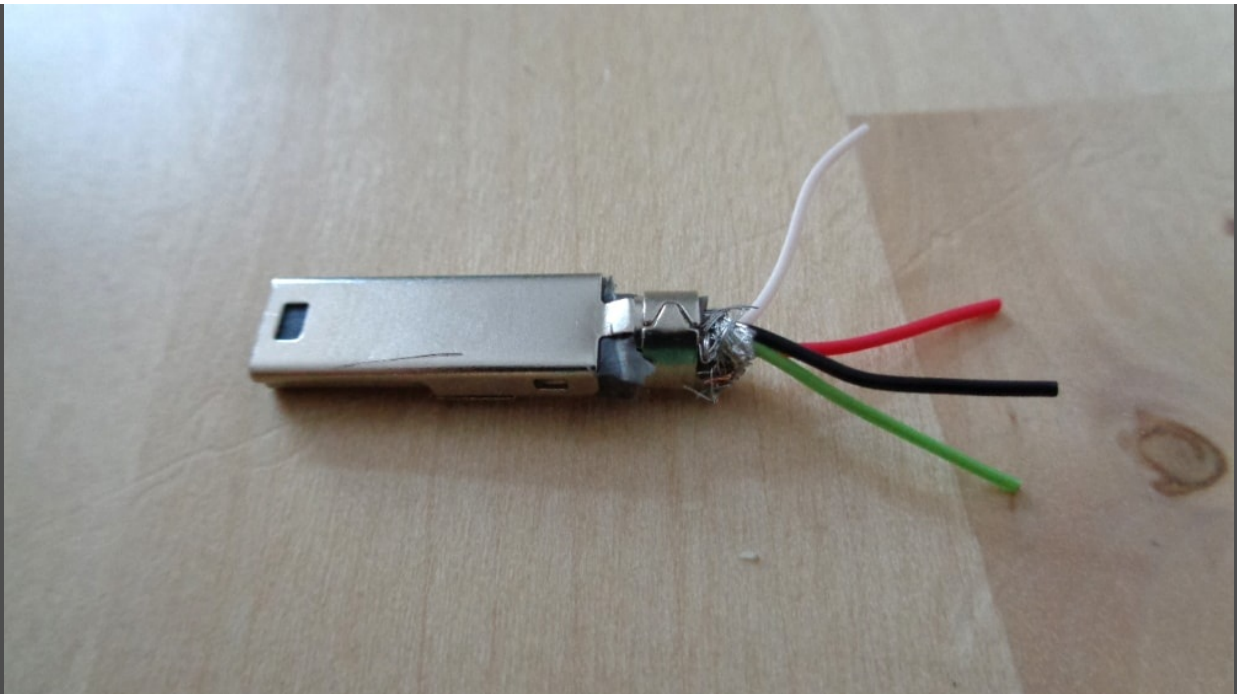
After the whole plastic was peeled off and I put the plug into the USB hub, I could already see that the space could get a little tight. Nevertheless, I continued only at another place. Because I wanted the cable to come out the front of the figure, I had to drill a hole. Unfortunately, the two photos were much too shaky. I measured the diameter of the cable with a digital measuring device and then selected a suitable drill insert. For plastic I always use drilling inserts that were made for wood. This works best so far and I had no problems with it yet. When drilling, at least you have to check twice if the drill is in the right place, because you can't make any mistakes in the front. In the back you can still cheat a little (I will also do).
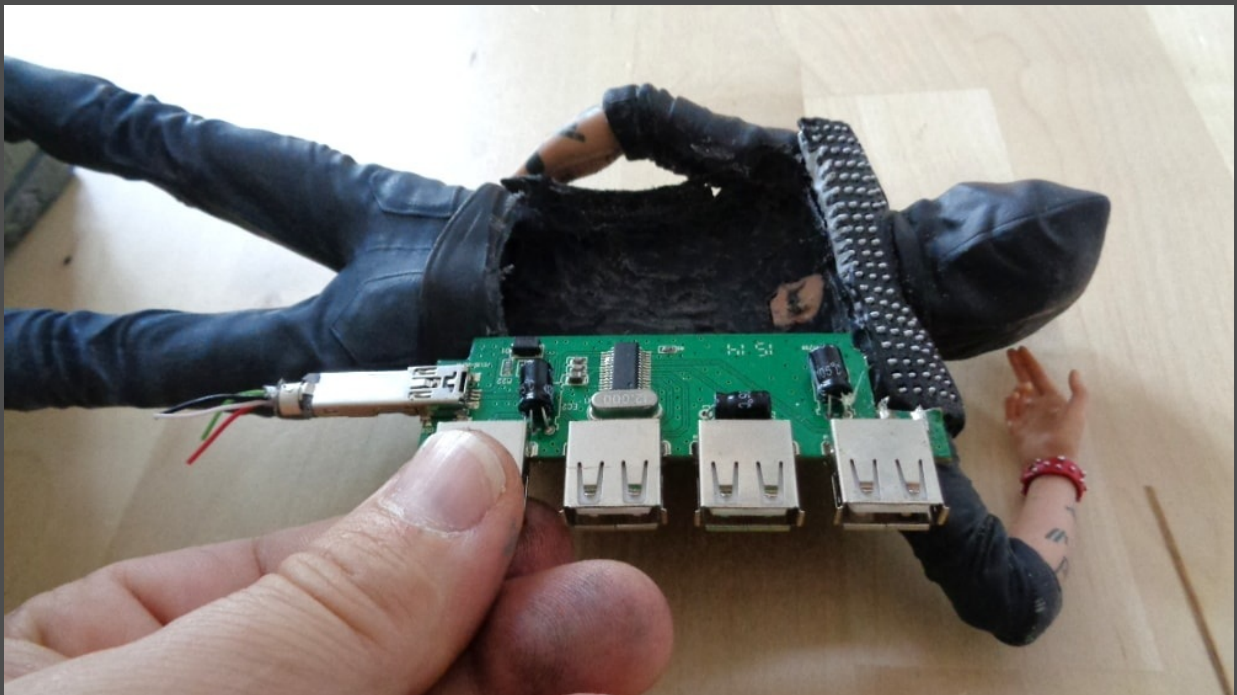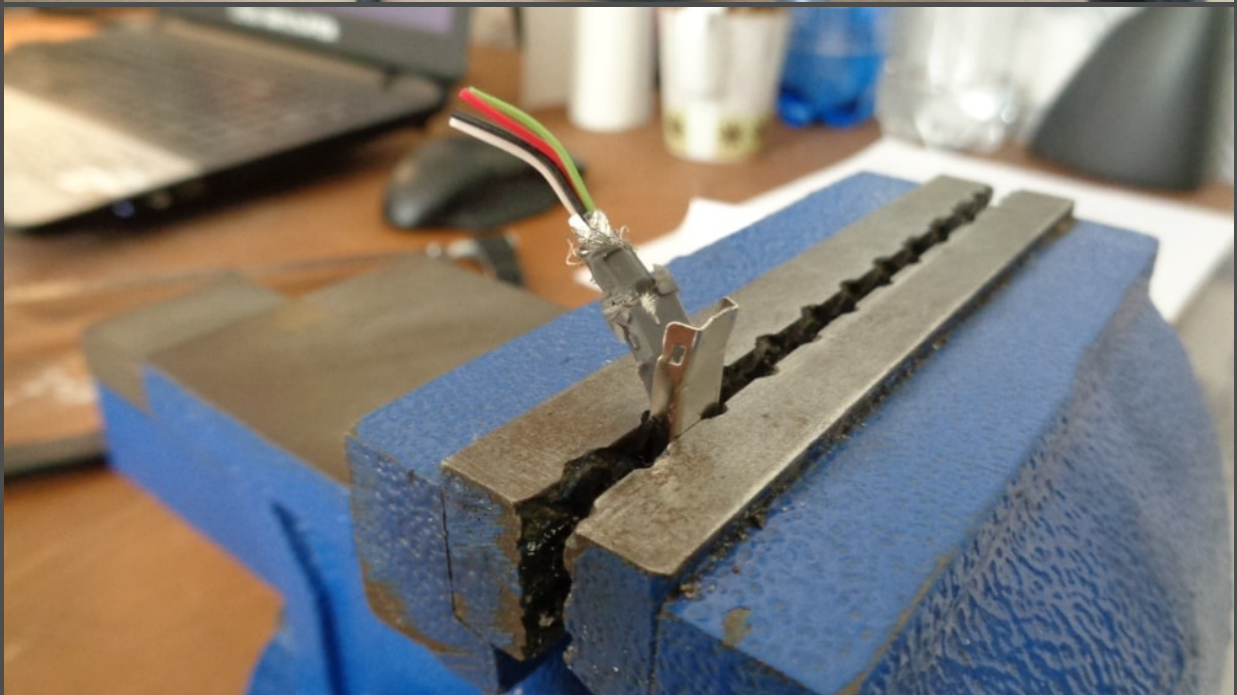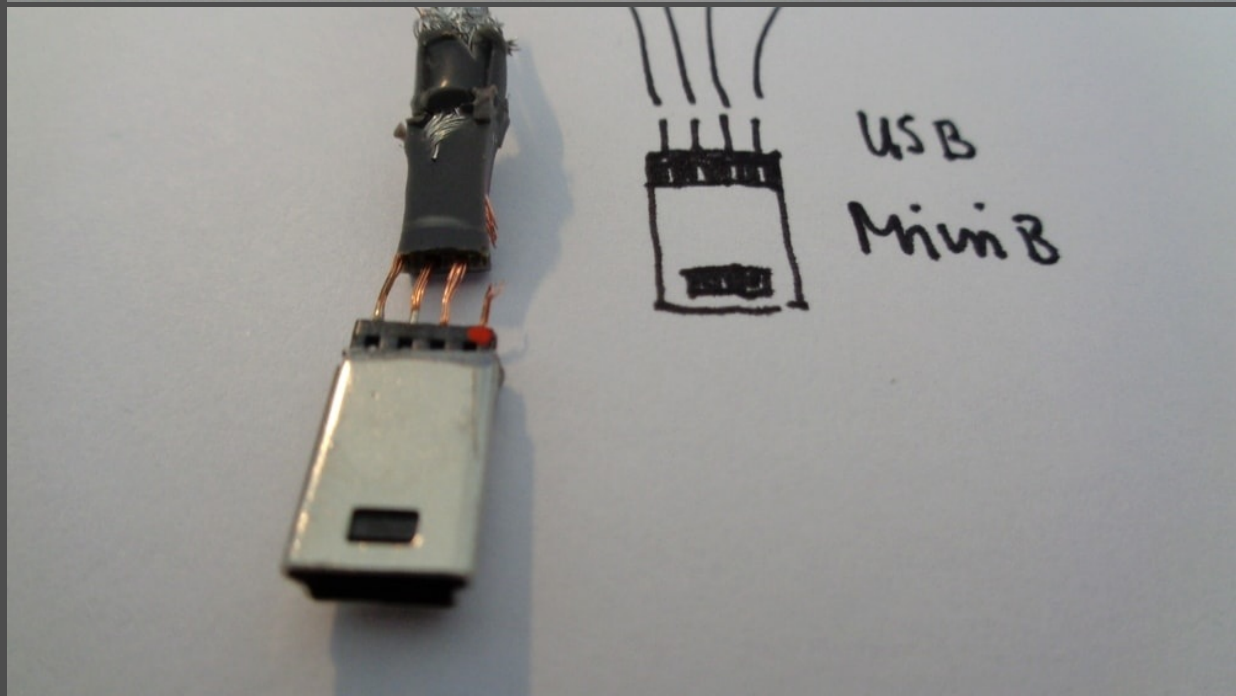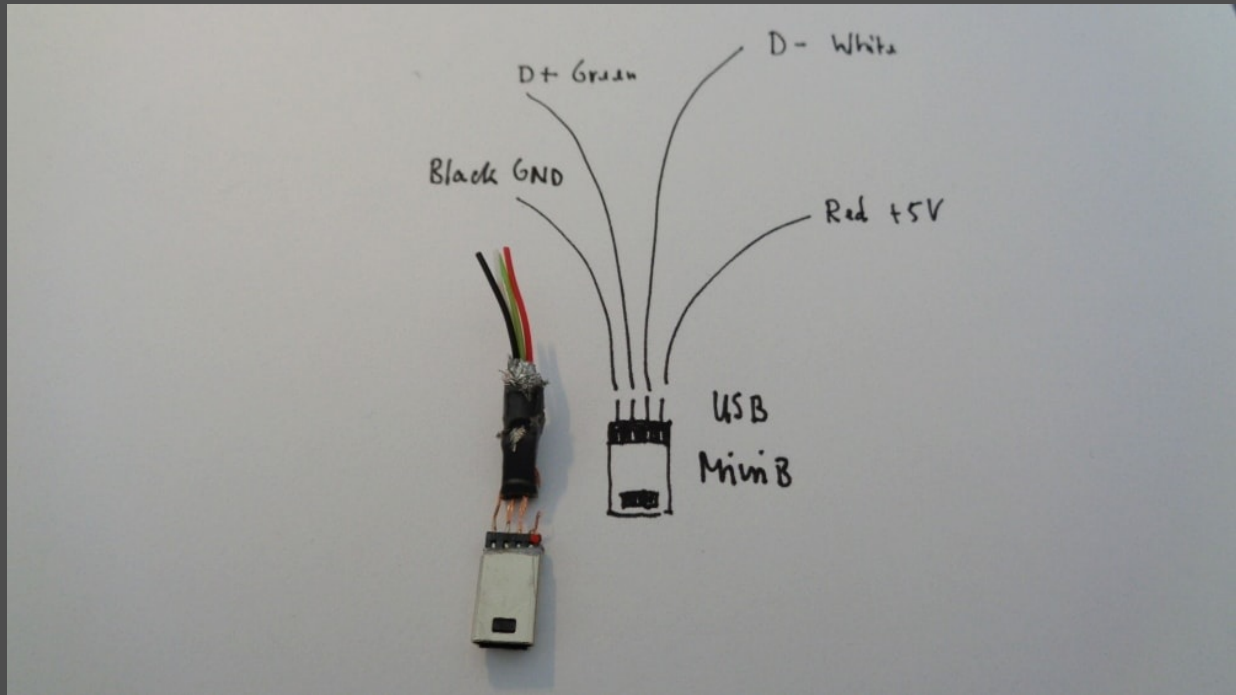
After installing the cable at the front, I was able to hold the board to the figure again. Now my guess was confirmed and I had to remove even more from the USB connector. I took off the metal

cladding for this purpose. Unfortunately, a cable broke off and I had to remove the rest. On the drawings you can see how the assignment of the wires is arranged.


In most cases it is also better to solder on completely new cables anyway, this prevents unwanted breakage. We take the other end of the USB cable and process it with the stripper so that we have a bare cable. Then we cut the shrink tube into suitable pieces with scissors and pull it over the cables. Clamp the plug into the helping hand and solder the ends in advance. Please have a look at a tutorial on the internet how to do this in detail. The metal wires that are too long are cut to the right length and soldered together. Finally we pull the shrink tubes over the blank areas and hold a lighter underneath so that they contract. Please be careful not to burn the cables.

D+ Green   D- White

Black GND

                          Red +5V

              USB
              Mini B
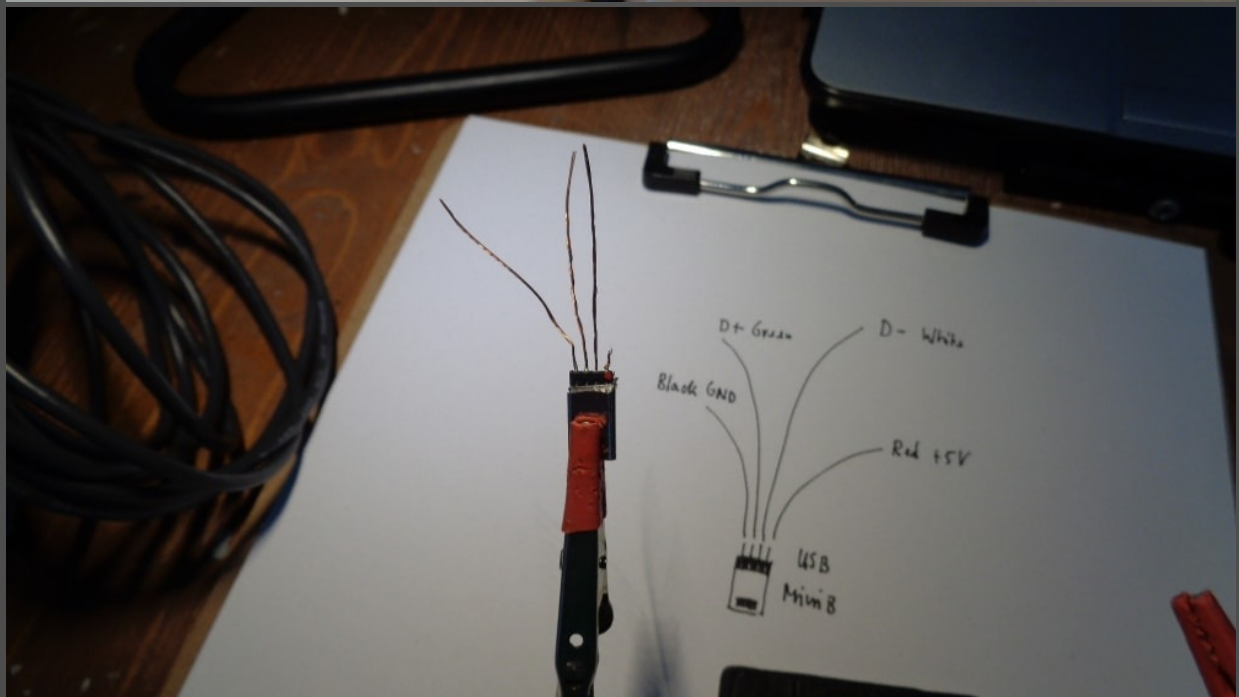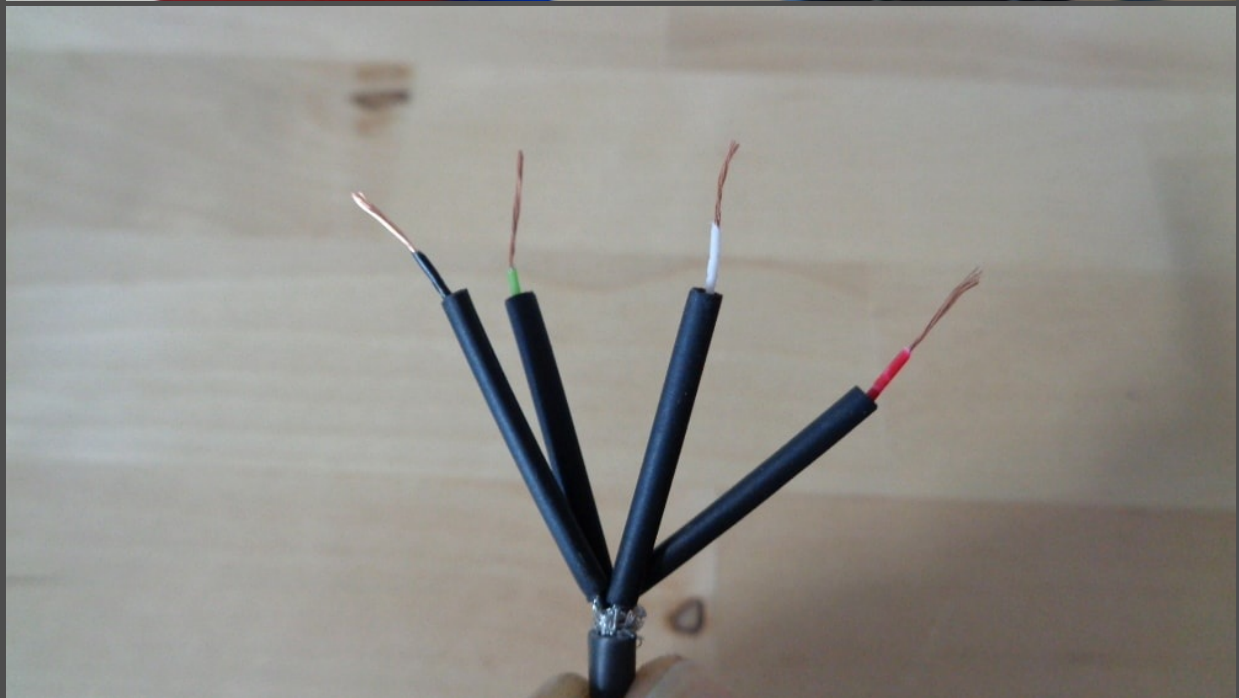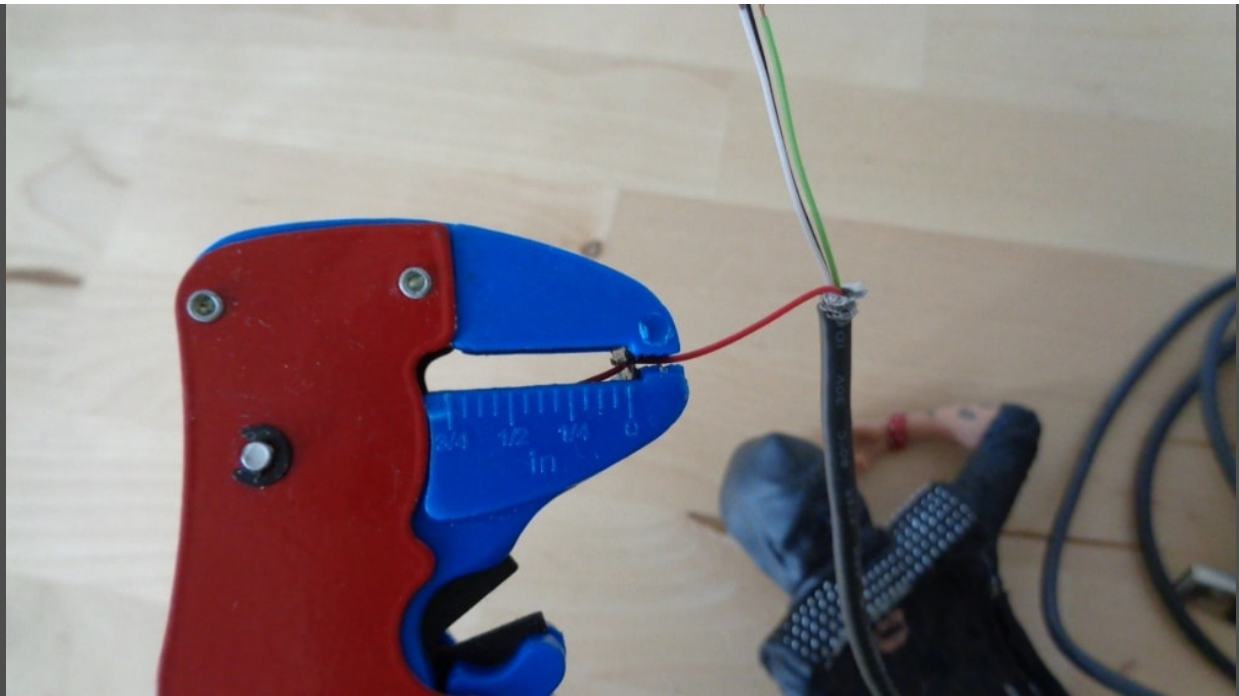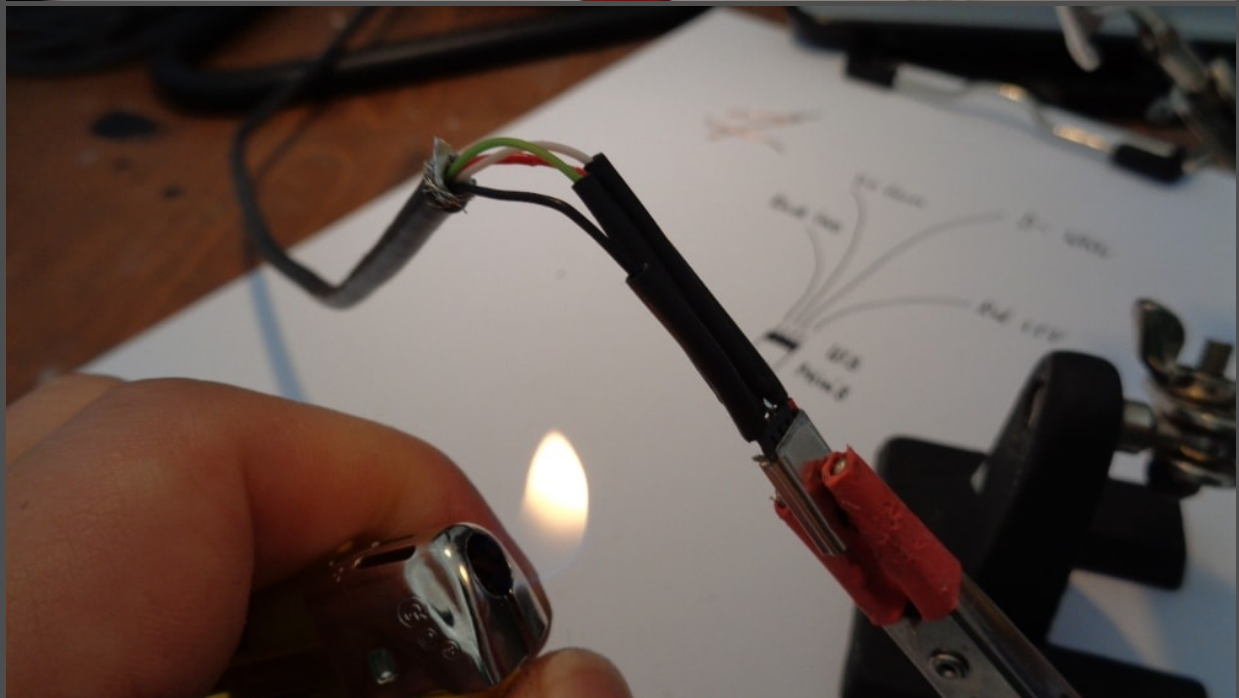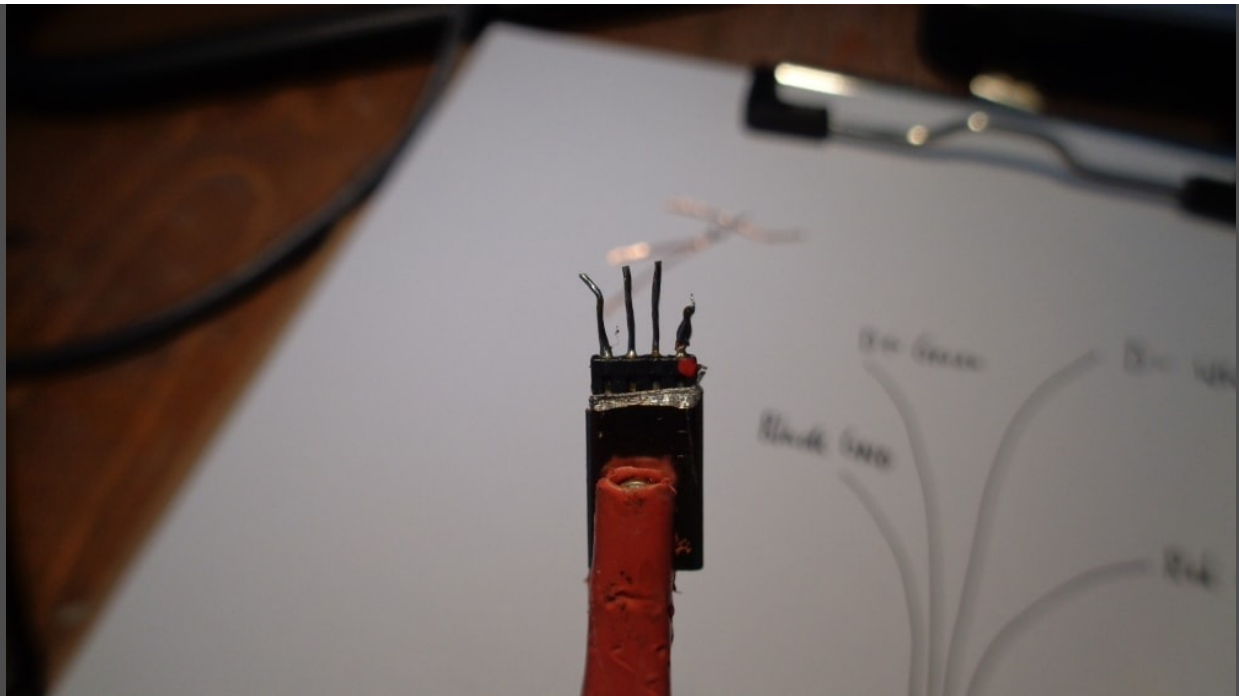
If you want, you can cover the cables with insulating tape to be on the safe side. This was already the most complex part of the project. Again we test everything if the hardware still works. As you can see on the back of the laptop monitor, the USB stick was recognized. With the cable it was still a little strenuous, because you have to clamp it carefully down into the legs. This is best done with a thin flat nose pliers, because you can use controlled force there. But you shouldn't bend it too much, because then the solder joints break through.
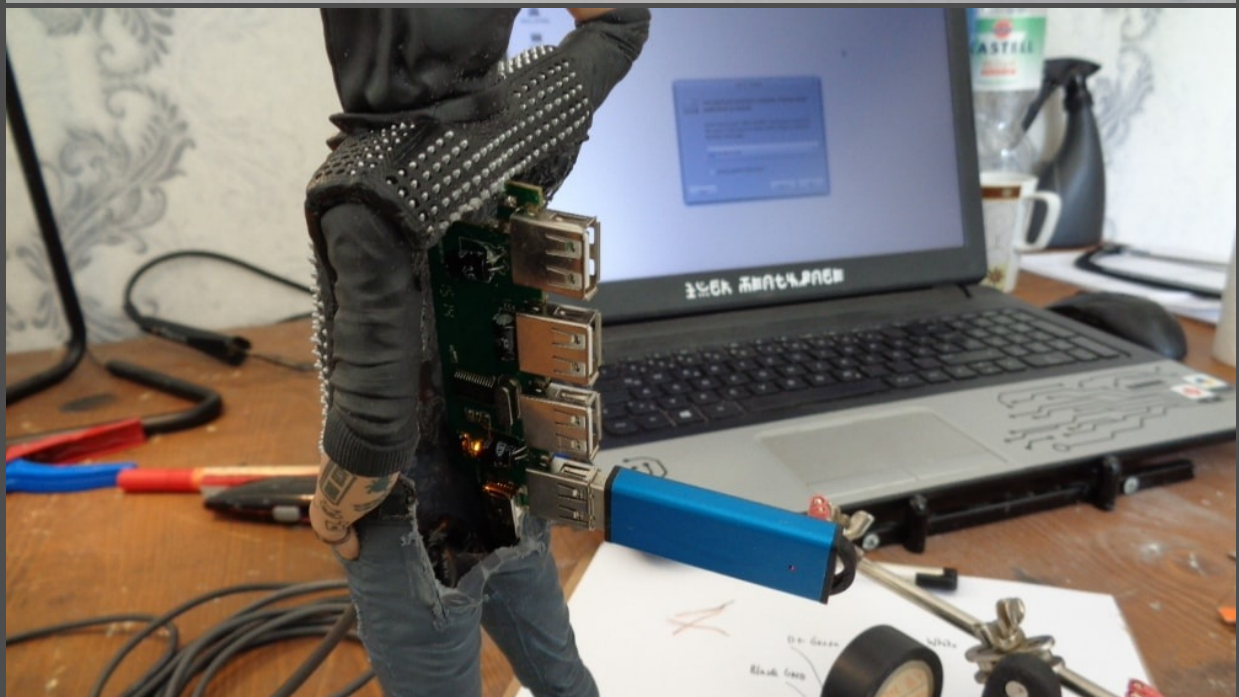
We fix the board with a little hot glue and then turn to the backpatch (and the ass). The backpatch must be cut in the middle so that the left and right side of the USB ports can be glued. Also the ass of the figure must be cut a little, so that everything fits. Unfortunately, this part is really difficult and even with a lot of patience this can only be solved very roughly. But since that's on the back and you don't see it right away, that's okay. I'm glad that the figure held at all and didn't break. I have to order Body Filler and see if I can work on it a little bit, but otherwise I am quite satisfied (for the first try).

Conclusion

Of course I'm not satisfied with the way my back looks and I'm sure you can do that even better, but I've achieved my main goal. I now have four USB ports that are not on my desk and are nicely hidden behind a figure. I also really enjoyed this project and was able to try out some ideas. In addition, the figure has a slightly wicked touch due to the forward looking cable and can be viewed ambiguously. I find collector's items beautiful, but I like them even more if they also have a meaningful function.